

FINAL Summary
Steller Sea Lion Recovery Team Meeting
Sheraton Hotel, Anchorage, Alaska
27-29 April 2004

Bob Small, Chair of the Steller Sea Lion Recovery Team (SSLRT or RT), opened the meeting at 08:40 on April 27. He reviewed the agenda and the primary objective of this SSLRT meeting: to make progress on preparing a draft narrative of the Steller Sea Lion Recovery Plan. Of key importance are the team's review of the threats list and the content of narratives that explain the threats. Small reminded the RT that the threats list and narrative sections are critical elements because they form the basis for the threats section from which actions to facilitate the recovery of the SSL will be recommended. The approach for the 3-day meeting is to go through the various draft sections of the Recovery Plan and to focus group discussion on substantive content of these sections rather than editorial matters. As time allows, the Team will work in small groups to take advantage of the assembled members and make some progress on writing assignments.

Small will set up an Intranet site to ease the process of document management; each SSLRT member will have password access to this site. The SSLRT Intranet site will facilitate sharing information, aid document management, and help track preparation of the recovery plan.

ESA Delisting Criteria Linkages in SSL Recovery Plan

In an April 14, 2004 letter, Small outlined the status of progress made to date in preparing the SSL Recovery Plan. This letter served as part of the agenda for this meeting. The RT must decide how to proceed with the organization of the Recovery Plan. Small reported that Capron believes the Team needs to address the five ESA factors for delisting a listed species and organize the document around these five points; the overall Recovery Plan recommendations should be clearly linked to the delisting criteria. There are optional approaches to accomplishing this, including showing the linkages between recommended actions and the five delisting criteria in a summary table. Regardless of the chosen approach, Capron emphasizes the need to show these linkages in the final Recovery Plan.

Genetic Stock Structure of SSL

The RT discussed the status of how genetic data on the wSSL stock structure will be incorporated into the Recovery Plan. The RT recommended NMFS convene experts and work through available genetic stock identification data in a workshop format. The objective of such a workshop was to determine the appropriate management unit of SSLs in light of new genetic data and analyses. The possible further split of the wSSL DPS into other units was considered. NMFS does not plan to proceed in this manner (workshop) yet; the agency may assemble a work group to examine the available genetic data on the wSSL DPS. But before doing so, NMFS may first look at approaches to defining population structure for Alaska harbor seals, and then perhaps use a similar approach to determining management units for the wSSL DPS. Thus, NMFS is still in the process of looking at how to interpret new genetic data in light of current and future management options for this species. For the purposes of the recovery plan revision,

the RT will include the current eSSL and wSSL DPSs. Small noted that this plan should recognize that these SSL DPSs extend into Russia and Canada and the RT should include in the Plan relevant Russian and Canadian information to enhance descriptions of the biology of the species.

Section III – SSL Biology and Life History

This Section is drafted, but a description of SSL critical habitat must be added. Specifically, this section needs a narrative on the background on how critical habitat was designated and a summary of geographic areas within the ranges of the eSSL and wSSL DPS that have been designated critical habitat.

Section V & VI Part A – Population Status and Trend

It was noted that information gaps should be added. Clarification may be needed regarding the location of the boundary between the eSSL and wSSL, and how the eSSL and wSSL geographic boundaries overlap with, or do not overlap with, the geographic definition of eastern Gulf of Alaska (GOA) and western GOA used in fishery management, and why some of the “eastern Aleutian Islands” actually is part of the western GOA. The PVA uses slightly different clustering boundaries: e.g., the eastern GOA is part of the Prince William Sound cluster. Clarification of these different areas and boundaries is needed; perhaps add a map that illustrates these areas and boundaries, or include a terminology and geographic boundary definition section in Section III. B.

Section V. Part B – Factors Potentially Influencing the Population

RT discussion focused on three sections in need of Team review: Predation, Harvest, and Nutritional Stress. Only Predation and Nutritional Stress were discussed in detail.

1. Predation

Atkinson reported on a recent workshop that suggested that disease was not a likely cause of the SSL decline. Recommendations from that workshop included the need for long term monitoring of disease in the SSL population. New literature on disease should be included in the SSL Recovery Plan, Section V; it was suggested that a disease specialist and/or veterinarian review appropriate parts of Section V.

In the section on predation, the Team will take a retrospective approach to evaluating the relative magnitude of transient killer whale predation on wSSLs. Barrett-Lennard’s model has been used to simulate historic killer whale predation. The model includes provision for assumptions on the functional response of a killer whale’s diet when its prey base changes; changing these assumptions or those that affect the vulnerability of various age classes of SSLs to predation mortality has a substantial effect on simulation results. The bottom line: there is no clear indication of the historic importance of killer whale predation on the SSL decline. The Subgroup has requested Barrett-Lennard to make minor revisions to the model such that forward

simulations can be conducted to allow examination of the relative impact of killer whale predation to the recovery of SSLs.

Small noted that the mortality simulated by the model is completely additive to SSLs mortality inherent within a stable SSL life table, which presumably already includes substantial mortality due to killer whales. Small noted that there might be new information from surveys of killer whales available later this year.

The RT continued discussion on the role of models in understanding SSL population dynamics; i.e., uncertainties, assumptions, the iterative process, and necessary elements of research.

2. Nutritional Stress

The RT has already spent a large amount of time on this issue; several recent RT meetings have focused on nutritional stress and its role in SSL decline. A RT Subgroup has prepared text on nutritional stress for the Recovery Plan (Feb 2004), and another subgroup has reviewed that text. All Team members now have this section with highlighted comments. The Team needs to focus on major content issues. The hypothesis of nutritional stress is reviewed here; the relative importance of nutritional stress is outlined in the threats section. The conclusion from all this work seems to be that nutritional stress cannot be discounted as a contributing factor to the SSL decline.

The following are key elements of this issue discussed by the Team, and the action items agreed upon:

- a) In the section on energetic demands of SSLs, RT members questioned whether the issue of junk food has been reconciled. They suggested that this section could include information on other otariids that seem to be doing well on a diet with a high proportion of gadids (e.g., California sea lions), or include information on populations that are increasing on diets with a high proportion of gadid species. This section could also point out the SSL population trends off the West Coast where SSL diets contain a high proportion of Pacific hake and note that these populations are actually increasing in size while on a diet with a high proportion of gadids. There may be data on SSL diet composition off Washington; Pitcher noted that there are no rookeries between southern Oregon and Vancouver Island. The RT recommends bringing into this section more information on SSLs that are thriving, or even increasing in population size, with a high proportion of gadids in their diets.

Action: The RT Subgroup will integrate this information.

- b) RT members questioned the mechanism involved in how nutritional stress reduces SSL survival or reproduction. The report needs to clearly explain this linkage. The chronic effects on SSLs from nutritional stress are not understood. While there are some examples of how acute nutritional stress may affect these animals, there is little available on the mechanisms for how chronic nutritional stress affects SSLs.

c) In Table 1, the narrative must identify the baseline against which the determinations are made. The RT Subgroup still needs to fill out this table and bring it to the RT. Some RT members questioned the value of this table. Options included removing it, leaving it in, or leaving it in and filling out the rest.

Action: The entire RT filled out the table. The RT Subgroup responsible for this section must still add narrative text that explains the origins of the table, how the ratings were defined, how the ratings were assigned, and provide an example of the process.

d) In the section on fishery effects on SSLs, some RT members suggested that the narrative seems to downplay effects of localized depletion. This could be addressed by including better descriptions of how overall fish biomass is estimated and describing how levels of exploitable biomass are determined, including a description of how fishery stock assessment and management works relative to SSL prey species, or moving parts of Appendix I into this section.

This section also could include a review of the combined and cumulative effects of many decades of fishing on certain components of the SSL prey base, such as herring. Since there are still large fisheries on some SSL prey species; some RT members questioned whether this section should include recognition of the possible overall impacts of these historic fisheries. They also suggested that the section include the synergistic effects of both historic and contemporary fisheries on SSLs, and recognize that salmon are an important component of the SSL diet.

The RT also discussed the efficacy of including in this section recognition and a description of the modifications that have been made to fishery management to mitigate SSL declines; e.g., the management changes in the Atka mackerel, Pacific cod, and pollock fisheries to provide SSL prey field buffer areas.

Action: Stump and Behnken will draft paragraphs on the above areas for RT consideration.

e) Table 2 – The RT discussed how to make this table more informative. Currently this table describes gaps in knowledge of some fished stocks; some wondered whether more quantitative information should be included. Others suggested that the narrative needs to clarify “present” abundance and how “present” is defined (2004?). Still others wanted the narrative to recognize that fish populations fluctuate in abundance based on recruitment processes, climatic factors, etc. The RT could consider footnoting the table extensively; Appendix I discusses many of these species and explains stock trends. The RT could also consider replacing Table 2 with graphs of biomass change, perhaps adapted from the NPFMC SAFE documents. Graphs of stock trends over past decades, by region could be presented, including notes on which stocks are fished commercially and which are not.

Action: The RT will replace Table 2 with graphics. The Subgroup will prepare figures on stock trends, by region, based on data presented in the Council’s SAFE reports. Tabular information on stocks will be retained where status is unknown.

f) It was suggested that the RT consider including in the nutritional stress section information on the availability of prey to SSLs, per capita (i.e., look at the amount of prey items available to each individual SSL, both in the past and today). Some RT members questioned the extent to which this is part of the nutritional stress discussion. Perhaps past Biological Opinions could be reviewed for relevant information.

Action: Include this information in the revised document.

g) RT members suggested that this section needs a link between prey availability, nutritional stress, and how nutritional stress may affect SSL physiology and thus reduce fitness such that it leads to SSL mortality. There are some examples in the literature where prey availability was a factor that ultimately was manifested in the animal population size, and some of these cases could be incorporated in the narrative. They suggested that if the RT can demonstrate how nutritional stress is manifested in the SSL population, then it can craft a better argument for mitigation-related actions in the Recovery Plan (e.g., what happens when nutritional stress leads to reduced birth rate).

Others suggested that this section also needs to point out that there is disagreement in the scientific community over the Springer et al. (2004) hypothesis.

Other discussion focused on a need to recognize that the narrative discussion of localized depletion may be more applicable to sedentary prey species (species that have a small home range) like Atka mackerel rather than to migratory species like pollock and cod. Some questioned the relevance of fishery removal rates versus prey availability to SSL – see the top of p. 8. Seasonal fishery harvest rates are higher; fishing does not occur at an even rate year round. What, then, are the potential effects on prey availability in those areas and seasons when fishing rates are high and then when fishing rates are lower? RT members suggested there be some recrafting of the language in this section (top of p.8).

Action: The RT Subgroup will do some editing for RT review.

h) It was suggested that the terminology used in the summary section to describe effects of fishing on SSL more clearly reference SSL birth rates rather than SSL births.

i) In Appendix II, RT members suggested a need for some clarifications in terminology. In the B20 vs B40 discussion on p. 26 (footnote), they questioned the extent to which the Council's F40 report (see p. 27) included possible consideration of F50 or F60. Others suggested a review of how the Goodman et al. report is portrayed in this Appendix. In Appendix I, some suggested that the reference to a vessel being capable of several hundred ton tows is misleading, and that this Appendix should better characterize normal vessel tow capacity. There may be only one vessel in the North Pacific fleet capable of this feat, and then likely only with a pump vessel. They noted that as written, the statement (p. 17) is untrue; 100 mt catches are more typical of catcher/processors in the pollock fleet.

Action: This section will be edited appropriately.

Cumulative Effects Section

The RT discussed how to integrate natural climatic factors – El Niño, for example – or PDO – into the narrative – how to describe their effects on SSLs. They suggested that this section also should note that human effects are additive to these natural factors.

Threats Tables

The RT has developed a list of threats to the wSSL and eSSL populations using a matrix and a classification of the fields in the matrix. Given the lack of information available to score some of the fields, the RT Subgroup made the scoring more qualitative in nature and obtained comments from others on the RT. Since the last meeting, the RT Subgroup also consolidated some of the threats and added some new threat categories (e.g., terrestrial habitat). The RT now has the result of this effort in a revised “Threats Table for Western (and Eastern) DPS of the Steller Sea Lion”. The “Probability of Occurrence” and “Total Loss Score” columns were multiplied to generate an “Absolute Impact” score. If that score was <3, the “Relative Impact” was termed Low; if 3 to 6, Medium; and if >6, High.

The RT discussed the shortcomings of the methods used to derive scores on this table. These included: how to judge differences in wSSL versus eSSL scores, and whether the eSSL DPS fits a “threatened” classification given the results of this scoring. Some suggested the tables need narratives to help with interpretation. Perhaps the narrative could consider which of these factors are potentially causing mortality ABOVE natural mortality. Others questioned how these results compare to the mortalities reported in Loughlin and York (2000)? Others questioned how to apply this table to potential recovery actions.

Small noted that the intent of the tables is to guide discussion on what are the most likely threats to SSL recovery, and to initiate discussion of mitigation efforts that could be applied to stem this decline. He suggested that while the table may have initially been conceived as a “mortality table”, it needs to be more of a “threat” table to be useful in recovery planning. It is currently more mortality based, probably because of the focus on the wSSL DPS where any mortality could be considered a threat, regardless its nature. The RT discussed whether any mortality could be considered a threat to the wSSL DPS. Some RT members suggested that managers must consider some mortality as part of the natural system, not under their control; such mortality is not really a threat – it is reality. Others maintained that for the purposes of recovery planning, and considered as a threat to recovery, any mortality, regardless of its nature (natural or anthropogenic), should still be considered a threat. Some suggested use of the term “relative” threat. The RT concluded that, for the wSSL threats table, this approach is appropriate; i.e., any mortality=threat. For the eSSL threats table, however, it may not be appropriate to equate all mortality to threat. The RT also discussed how to deal with a definition of high/medium/low threat levels, and whether quantification of these could help lead to more specific recovery recommendations.

The RT discussed at length whether to address the eSSL population threats table now. The eSSL threats table was eventually set aside to be addressed later.

1. The wSSL DPS Threats Table

The RT discussed at length:

- how to define “threat”,
- whether a threat should include natural mortality,
- whether a threat is the cause of mortality or something else related to the threat,
- whether to describe the mechanism for how a threat may affect an animal,
- whether to describe the linkages between both distant and proximate causes of SSL mortality and,
- whether the more distant cause of mortality is the threat or the final (proximate) cause of mortality is the threat.

This lengthy discussion ultimately led to acceptance of a revised version of the threats table prepared by Trites (discussed below). The RT also agreed that a narrative must be written (carefully) to accompany the threats table; this narrative must explain the concept of threat, the uncertainty prevalent in the process of how threats were derived and then scored, and the mechanisms for how a threat may result in SSL mortality. The RT also discussed whether, and how, to adjust the threat scoring. The RT acknowledged that the scoring was partly subjective, but represents the input of those who participated in the scoring effort. The following threat scores were discussed:

- Incidental catch – medium. Some RT members believe this score is too high. They note the Russian herring fishery does take some wSSLs incidentally, justifying concern. The RT believed that changing the title of this threat to “fishing activity associated mortality” would better capture entanglements, hook swallowing, harm from bait box packing bands, etc.
- Entanglement in debris – low. This category should exclude fishing-related debris, which is covered in another category.
- Killer whale predation – high. General agreement.
- Prey removal (fishing) – high. Some questioned whether this score is based on current conservation measures, or on how things might be without the current measures in place. A high score seems to imply that fishing/prey removal is still a high threat, even under the current SSL protection measures that have removed jeopardy and adverse modification. The RT accepted this as a threat since fishing may be inhibiting SSL population growth in some areas, even under current fishing regulations. The recovery bar is set higher than the JAM bar, and fishery prey removals may be constraining the population from attaining a higher level of abundance. The current protection measures could be considered as “holding the line” but not sufficient to allow for recovery to a higher population level.
- Several natural mortality threats categories – all low. Some RT members questioned whether these should be considered “threats” since they are natural and part of the “baseline” condition. Others questioned whether natural mortality should be rated higher than low. The RT accepted retaining natural factors as threats.

The RT discussed using the PBR for wSSLs as a surrogate for ranking threats. The team agreed to use a relative ranking system, using PBR as a metric against which each threat can be compared and then ranked. Natural mortality would be excluded from the scoring, as it is assumed to be part of the baseline. PBR is 209 for wSSLs; if the number 200 is used, the RT agreed on scoring the threats as follows: low threat = likely to cause mortality of less than 20

wSSLs per year; medium threat = 20 to 200 animals per year; and high threat = more than 200 animals per year.

The RT discussed further the concerns over listing fishing as a major threat (ranking fishing as high). Some team members believe this may be the crux of the job of the SSLRT – to define whether or not to further restrict commercial fisheries to help the SSL population recover. If so, the RT must know its recovery objective. Some suggested that a desirable growth objective would be 6-8% per year, or about 4,000 wSSLs. Small reminded the RT that its objective here is to evaluate sources of SSL population decline: birth rate, death rate, movement – and to identify anything that can contribute to those three causes of SSL population decline as a “threat”. Fishing is appropriately on this list at some level. The narrative must clearly explain the reasons behind the threat rankings.

The RT returned to the remaining key decisions regarding the threats table:

- How to deal with natural mortality. Is natural mortality a threat or a baseline condition? Is a “threat” only a potential source of mortality above natural mortality factors?
- Should the RT use a metric to help rank each threat? Should the RT retain, or discard, the rating process used to generate this threats table?
- The RT should factor in uncertainty, and at least agree on how uncertainty is addressed when scoring threats.

Natural mortality – the RT felt that natural mortality factors should be considered threats to recovery of the wSSL population. The threats tables identify some threats that are over and above natural mortality. Recovery is defined as resulting in an increasing rate of population growth, not an increase in numbers of animals. Threats are over and above natural mortality only in a stable population, which the wSSL is not. A threat may be considered a factor that has a possibility of affecting growth of the population or recovery of the population. Rate is the goal – increased population growth rate. All agreed with this definition of threat.

Metric – all agreed to use PBR and to use high, medium, and low as the rankings. PBR is 209 – but the RT will use 200. Threats would then be ranked according to the following: High is potential mortality over 200 animals, medium is 20-200 animals, and below 20 animals is low.

Uncertainty – will be clearly described and included in the narrative that accompanies the threats tables.

The following threat categories were discussed and some explanations or score adjustments were made:

- Incidental catch (including all sources of fishing-related debris entanglement) - Raise the ranking of this threat to high.
- Disease –The RT discussed at length such issues as endemic versus epidemic disease, how to determine when disease might be a threat over and above natural incidence of disease in the population, what might be “unnatural” disease, whether disease might be related to SSL prey, and recent suggestions from veterinary pathologists that do not consider disease a likely cause for the SSL decline. The RT agreed to score disease as low.

- Toxic/natural and toxic/anthropogenic – RT discussions included describing natural plankton blooms and their potential toxic effects on SSLs. The RT retained two categories, renamed as shown here, rating the toxic/anthropogenic threat as medium and toxic/natural threat as low.
- Disturbance – Research or tourism activities can cause SSLs to stampede and crush pups. Evidence indicates that disturbed rookeries return to nearly the pre-stampede status within a few days, so this is not as great a concern as some thought. Rate low.
- Shark predation – The RT does not consider this a major concern. Rate low.
- Terrestrial habitat limitations – Probably not relevant to SSL recovery. Remove this threat from the list.
- Research activities – This may include branding, making pup counts, other research activities, and may be of concern on dense rookeries. It is conceivable that research activities disturb enough animals that may result in some mortality. Rate low.
- Reduced prey biomass/competition – Some RT members questioned to what degree “competition” is similar to or the same as natural environmental conditions causing reduced prey biomass. There is evidence that some top predators remove large quantities of SSL prey, e.g. arrowtooth flounder or humpback whales. The RT questioned the level of mortality this might cause to the SSL population. During El Niño years, this issue may be of greater concern if warmer water increases populations of competitors. Some on the RT felt that competition could be a major cause of SSL mortality, while others felt that this factor could be ranked low given the lack of information. All agreed uncertainty is high. More discussion focused on mixing natural and anthropogenic factors, and whether this excluded natural factors as threats. One option suggested was to remove natural factors from the stress table, define these concepts in the narrative, and omit ratings for each of these natural factors. The narrative could describe how habitat may have been changed and explain that these are natural threats. Others suggested that the RT should consider that the environmental carrying capacity of the North Pacific may have changed, and as a consequence some new “natural” factors may be affecting SSLs in ways that cannot be mitigated. Some RT members noted that if all natural threats are removed from the table, then there must be a mechanism in the Recovery Plan where the Team can weigh in on the relative importance of these natural factors. The RT generally agreed that natural factors that affect SSLs need to be discussed – somewhere. The RT decided to leave natural factors in the table. All prey reduction natural factors will be combined into one category and competition will be kept as a separate category. The RT discussed whether to rank natural factors as high and competition as high. Uncertainty associated with these factors certainly is high and ability to mitigate these factors is low. The RT could not agree on a ranking and left that to another day.
- Disease – This category now includes parasites.

The RT voted their preferences for scoring the relative impact of all the threats as follows:

1. Predation/killer whales – high
2. Reduced prey/fishing – high
3. Subsistence harvest – medium
4. Illegal shooting – medium
5. Incidental catch – high
6. Disease/predation – low
7. Reduced prey biomass/natural – low or high?

8. Entanglement in debris – medium
9. Toxic/anthropogenic – medium
10. Disturbance – low
11. Mortality from research – low
12. Toxic/natural – low
13. Competition/reduced prey – low, medium, or high?
14. Predation/sharks – low

The RT then further discussed several of these categories and their ranking:

Fishing and prey removals – There is a lack of evidence on a connection between fishing and the SSL decline. Some questioned why this factor was rated high when there are no data suggesting a problem. Within the ESA construct, the burden of proof still requires maintaining concerns over fishing/prey removal as a threat to allowing the SSL population to increase. Current regulations may prevent the SSL population from declining further, but these regulations may not be sufficient to enable it to increase, which is part of the definition of recovery.

Subsistence – Some questioned why subsistence is rated only medium. If the SSL PBR is 200, and the average take is about 180 SSLs annually in the subsistence harvest, this falls into the medium category. Data are not firm, but in other subsistence harvests (e.g. Pribilof Islands fur seal harvests) estimated harvests were higher than actual harvests. Thus, the 180 number may be fairly good for SSLs.

Illegal shooting – Some believed that there seems to be too high a degree of uncertainty for this threat to be given a medium rating. Large education efforts over past years have likely reduced what was fairly large numbers of illegal shootings. While the numbers have declined, the majority believes it warrants a medium rating.

Other issues:

SSL genetics – RT members asked whether there is any evidence of SSLs going through a population bottleneck? There is no evidence that the wSSL population has gone through such a bottleneck based on research conducted by John Bickham. The wSSL DPS has high heterozygosity; so does the eSSL DPS; there is no evidence in the wSSL DPS of any change that may have reduced genetic diversity.

2. The eSSL DPS Threats Table

The RT discussed how to complete a scoring of each threat to the eSSL DPS. Some felt this would be too time consuming. One suggestion was to score all eSSL threats as low since the population is thriving, increasing, and, except for a group of eSSLs in California, not likely to be threatened at the present time. The RT recognized the need to treat threats to the eSSL population differently. The threat category termed terrestrial habitat limitations will be removed. Other than the California population, threats to the eSSL DPS seem to be low overall. The RT suggests that the Recovery Plan could consider the California population as a separate recovery unit; however, to do so will require written rationale and justification for this approach. The RT concluded it best to leave the eSSL DPS defined as it is. [Canada considers the eSSL as

threatened, partly because of the low number (3) of breeding populations in Canada. Two main threats: susceptibility to being stampeded by humans, and susceptibility to oil impacts from tanker traffic.]

Pitcher reviewed the status of the eSSL population off Washington, Oregon, and California. The southern California eSSL population group in the Channel Islands is essentially gone, replaced with large numbers of California sea lions. Elephant seals also are abundant. The ecological dynamics in this area have changed dramatically, but the causes are unknown. The central California eSSL group is not doing well, but the northern California groups of SSLs are doing well. ESSLs along Oregon's southern coast also are doing well, as are Washington SSLs. A manuscript summarizing the status of the eSSL population has been drafted and will be available to the RT soon.

In British Columbia, the eSSL population trend is upwards. Trites will check on availability of a report on eSSLs in Canada.

The RT agreed to not discuss the eSSL DPS further in this meeting, and to score all threats to this population as low, for now.

PVA Status Report

The RT reviewed the draft PVA report, which describes how the model works and its status. Two other approaches were considered earlier, but are no longer being actively pursued by the team – the York approach and the Winship approach. The Winship approach did not contain movement parameters and approached PVA differently – not with recovery criteria as the goal. York was unable to set aside enough time to complete her model. The RT Subgroup concluded that Goodman's approach was deemed more in line with facilitating development of recovery criteria from the PVA. The RT still supports alternate model development and would be receptive to considering other modelers' concepts. The PVA model subgroup plans to meet in June to continue development. The RT may have some tentative results from the Goodman PVA model later this fall.

Previously, the PVA model was focused heavily on PDO – but now has been broadened to look at other environmental perturbations, cycles, etc. The Goodman model allows for environmental variability such as regime change, but can also keep environmental change static. The model can be applied to either the wSSL or the eSSL DPS. Right now it focuses on the wSSL DPS.

Eventually the RT needs to make a policy call on the extinction standard – i.e. should the RT try to be consistent with other recovery plans, other agency approaches, the IUCN, etc? The RT will make this call later this fall. It was noted that the USFWS and NMFS have a working group on listing criteria. Their document is not final yet – the SSLRT might use ideas from that effort in the SSL PVA model.

Stepdown Outline

Capron's draft outline was discussed, which categorizes recovery actions by the five ESA listing factors. Small referenced the recovery plans for the manatee and the Colorado pike minnow, which used different approaches. While the RT has flexibility in how to organize the Recovery Plan, the Team agreed that the Plan should clearly show how the five ESA listing factors are addressed in the recommended actions. The consensus was to use Capron's approach. The Team also plans to write a separate Research Plan and include it as an appendix. Small also suggested that, in preparing the recommended recovery actions, the Team write the narratives first, and then develop the priority of recovery actions – i.e., the basis for prioritization should spring from the narrative. Small will assign groups who will be responsible for writing the narratives (see below for assignments). The basic assignment will be to write one or more paragraphs for each element in the stepdown outline, making sure the narrative contains a description and justification of the action item, and the link/rationale to the threat(s), to the recovery criteria, and to the appropriate ESA listing factor(s).

Recovery Strategy

This is a new element of a Recovery Plan. It should be concise – about two pages. Small will write a first draft. The Recovery Strategy states the issue (what's the problem) and the overall plan to address the issue – i.e. the Recovery Strategy is a general synthesis of what will be done to arrest the SSL population decline - where the RT is headed to recover this population.

PVA – Recovery Criteria

Small noted that the Recovery Plan will need a section discussing PVA. The narrative should note that PVA is a tool to generate quantitative recovery criteria: i.e. desired number of animals, number of rookeries, etc. See the Colorado pikeminnow Recovery Plan outline handout for examples of quantitative recovery criteria, as well as qualitative recovery criteria associated with each of the five ESA listing factors.

Schedule - Recovery Plan Review Process

Small asked the RT whether an interim review of the outline and threats tables should be part of the protocol for preparing the draft report. Some agencies promote interim review. An advantage is that outside reviewers might point out missing information. Such a review would occur before the narratives are completely drafted. Reviewers might include people who have Recovery Team experience, who have some knowledge of the issues of concern, etc. The RT discussed this issue later, and concluded that an external review was not necessary. Some of the reasons include the potential for this to slow the preparation of the Recovery Plan draft.

Threat/Source/Cause Outline

Trites prepared a draft of a threats table that organizes the Team's thinking into five basic threats, each of which may have multiple sources and multiple causes. The RT considered this approach in an effort to make it easier to compare threats. The RT discussed:

- possible missing sources of mortality (e.g. trauma),
- the relationship between metabolic disorder and starvation,
- the connection between human activity and predation and entanglement,
- how entanglement could lead to infections,
- where does drowning during copulation fit?

The overall impression was that this approach to defining threats has merit. If the RT uses this approach, an accompanying narrative must clearly define the terms used and how to read the table – i.e. how does the table help the reader understand the ultimate causes of SSL mortality? The RT discussed other suggested changes in the table, one of which included adding a fourth column that shows the mechanism of mortality.

Small pointed out that the ability to sort on each field is important. This kind of table helps identify what factors might be monitored for each threat – it gives researchers a focus on what to monitor regarding a particular threat.

Conclusion – clean up the old threats table, and integrate into it the more detailed information from Trites' threat/source/cause table. Add a mechanism column. For example, "Killer whales – natural – predation" is the cleaned-up threat. The RT must also decide how much "natural" threat material will be included. A RT Subgroup will revise the threat table and draft the text for Section 10. Behnken will lead the subgroup of Stump, Fraser, Atkinson, Byrd, and Small.

Narrative for Threats Table

Section 10 of the Recovery Plan will provide the narrative that supports the Threats Table. Small asked the group what should be included in the synergistic and cumulative parts of that narrative. The narrative must describe how the Team arrived at these threats and ranked them. Mortality or reproductive issues are the pervasive components of why SSLs have declined. The writers of these narratives should look at the proportion of the SSL population that might be susceptible to each threat, and consider whether some threats may be cohort- or age-specific.

Chapter IV – Conservation Measures

This Chapter has been revised several times. Capron made the most recent revision, and Gelatt, Parker, and Fritz made some additional edits. Some new sections are included – e.g. adequacy of fishery measures. The following concerns were discussed:

Atka mackerel and localized depletion – Some believe this topic is not adequately addressed. The Chapter lacks information on the history of how this issue evolved. It would be helpful to add some narrative about the Council's 1998 deliberations and why some of the proposed

mitigation was rejected. The recommendation to the Subgroup is to beef up the Atka mackerel/localized depletion information.

Chapter Organization – The chapter seems to be organized primarily around the Magnuson-Stevens Act, and it is suggested that the chapter be organized more around the *intent* of the Act; i.e., describe the reasons why certain fishery management measures were put into effect. The suggestion is to better relate conservation measures to SSL recovery threats rather than to the regulations.

Historical perspective – The chapter lacks a description of the history of actions taken by the Council to benefit SSLs. The RT discussed whether it wanted to re-open this concept, as it could significantly increase the length of this chapter. One suggestion was to add a table that summarizes past actions taken that was directed toward SSL protection or recovery. The Team further discussed what level of detail is appropriate such that the reader can understand what previous management actions have been taken for SSL conservation. There are some other omissions and errors that need attention. The chapter needs to describe how conservation measures gradually, over time, addressed the threats from fishing to SSLs, and how these conservation measures have evolved to the very complex set of measures that are in place today. The difficulty is in how to do this without writing a book on the subject.

Conclusion – Wynne, Loughlin, and Byrd will join the Subgroup to prepare an outline of this chapter, organized around threat issues, and help revise the chapter.

Next Meeting

Small recommended that the RT not convene as a group until the Recovery Plan is drafted. Time is a pressing issue, however; a long wait between now and then is not appropriate. The RT will meet during the week of September 13 in Homer at the new USFWS Maritime Wildlife Refuge visitors' facility. Sitka will be an alternate venue. Small hopes that Dan Goodman can attend to present the results of his PVA efforts.

Narrative Writing Subgroups - Assignments

1. Nutritional stress – Williams, Fritz, Trites; Behnken & Stump provide information as indicated above.
2. Cumulative and Synergistic Effects (includes Threats tables) – Behnken, Pitcher, Stump, Fraser, Byrd, Atkinson, Small
3. Conservation measures, Ch IV – Wynne, Loughlin, Byrd, Gelatt, Fritz, Parker
4. Recovery Narrative – (follow the step-down outline):
 - a. Gelatt & Pitcher, Williams, Trites – 1
 - b. Small, Trites, Stump, Pitcher, Behnken, Fraser - 2
 - c. Jack, Parker, Wynne (3.2) – 3
 - d. Atkinson, Springer - 4
 - e. Capron, Small - 5
 - f. Lloyd, Hanson, Wynne – 6

Names underlined are the writing team leads. Subgroup leads are free to recruit other RT members to help with writing assignments. Use the narrative examples provided by Small at this meeting as a guide to the appropriate level of detail in each threat narrative; Small also suggested authors begin writing by using the language in the last plan. Keep the narratives focused on why each of the recovery actions needs to be done. The consensus was that each narrative (one narrative for each element in the step-down outline) should take no more than a few paragraphs.

Table 1. Attendance at the meeting of the Steller Sea Lion Recovery Team held 27-29 April 2004 at the Sheraton Hotel, Anchorage, Alaska.

*	Shannon Atkinson	Alaska Sea Life Center
*	Linda Behnken	Alaska Longline Fishermen's Association
*	Vernon Byrd	U.S. Fish & Wildlife Service
*	Don Calkins	Alaska Sea Life Center
*	Dave Fraser	F/V Muir Milach
*	Lowell Fritz	National Marine Fisheries Service
~	Tom Gelatt	Alaska Department of Fish and Game
~	Dave Hanson	Pacific States Marine Fisheries Commission
*	Lianna Jack	Alaska Sea Otter and Steller Sea Lion Commission
*	Denby Lloyd	Alaska Department of Fish and Game
*	Tom Loughlin	National Marine Fisheries Service
	Lloyd Lowry	US Marine Mammal Commission
*	Donna Parker	F/V Arctic Storm
*	Ken Pitcher	Alaska Department of Fish and Game
*	Ken Pitcher	Alaska Department of Fish and Game
**	Bob Small	Alaska Department of Fish and Game
*	Alan Springer	University of Alaska, Fairbanks
	Beth Stewart	Aleutians East Borough
*	Ken Stump	
	Clem Tillion	
*	Andrew Trites	University of British Columbia & North Pacific Universities Marine Mammal Research Consortium
~	Terrie Williams	University of California, Santa Cruz
†	Bill Wilson	North Pacific Fishery Management Council
*	Kate Wynne	University of Alaska, Kodiak
*	Steller Sea Lion Recovery Team Member	
~	Steller Sea Lion Recovery Team Member, absent	
**	Chair, Steller Sea Lion Recovery Team	
†	Rapporteur	

STELLER SEA LION RECOVERY TEAM MEETING

27-29 April 2004
Yukon Room, Sheraton Hotel
Anchorage, Alaska
Draft Agenda

Tuesday, 27 April

8:30 am

1. Review and approval of agenda
2. Status of splitting Western DPS (Shane)

8:45 am

3. Review and finalize sections of the Recovery Plan:
 - Background Chapters (III, V & VI (A & B)):
 - Predation
 - Nutritional Stress

12:00 pm – Lunch Break

1:15 – 4:30 pm

4. Review and finalize sections of the Recovery Plan:
 - Background Chapters (III, V & VI (A & B)):
 - Threats Tables; Cumulative and synergistic effects
 - Recovery Units?
 - Conservation Measures (IV)

Wednesday, 28 April

8:30 am

5. Continue to review and finalize sections of the Recovery Plan
 - Recovery Goals (V & VI: D)
 - PVA status report
 - Stepdown Outline

12:00 pm – Lunch Break

1:15 – 4:30 pm

6. Recovery Plan Revision: Status and approach for completion:
 - Recovery Strategy
 - Recovery Goals and Recovery Criteria
 - Stepdown Outline & Narrative
 - Implementation Schedule & Monitoring

Thursday, 29 April

7. Smaller groups meet separately
 - Nutritional Stress – revisions

- Threats Tables – revisions, Cumulative & Synergistic effects
- Stepdown Outline: Eastern DPS
- Recovery Narrative
- Recovery Criteria (Non-demographic)